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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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SUITE 1100

WASHINGTON, DC 20001

EXAMINER

MYINT, DENNIS Y

ART UNIT

PAPER NUMBER

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/724,170	Applicant(s) CAUDILL ET AL.	
	Examiner Dennis Myint	Art Unit 2162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 54-58 and 70-80 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 54-58 and 70-80 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>01 December 2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 54-58 and 70-80 have been examined.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 54, 55, 56, 57, 58, 70, 71, 72, 73, and 74 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-63 of U.S. Patent No. 6766316 (Caudill et al.). Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1-63 of Patent No. 6766316 (Caudill et al.) contain every element of instant claims 54, 55, 56, 57, 58, 70, 71, 72, 73, and 74 and as such anticipate instant claims 54, 55, 56, 57, 58, 70, 71, 72, 73, and 74.

Namely, instant claims 54, 55, 56, 57, 58, 70, 71, 72, 73, and 74 are anticipated by the combination of claim 5 and claims 14, 15, 16, 17, 18, 14, 15, 16, 17, and 18

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respectively of U.S. Patent No. 6766316 (Caudill et al.). Instant claims 54, 55, 56, 57, 58, 70, 71, 72, 73, and 74 recite limitations that constitute a subset of all possible conditions already encompassed by the scope of claims 14, 15, 16, 17, and 18 in combination with claim 5 of U.S. Patent No. 6766316 (Caudill et al.). See *Georgia Pacific Corp v. United States Gypsum Co.*, 52 USPQ2d 1590, U.S. Court of Appeals Federal Circuit 1999. These claims are too obvious over claims 14, 15, 16, 17, and 18 of U.S. Patent No. 6766316 (Caudill et al.) at least in view of the Georgia case (see above).

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claim 54-58 and 70-80 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

MPEP 2106 IV.B.2.(b) states that “a claim that requires one or more acts to be performed defines a process. However, not all processes are statutory under 35 U.S.C. 101. Schrader, 22 F.3d at 296, 30 USPQ2d at 1460. To be statutory, a claimed computer-related process must either: (A) result in a physical transformation outside the computer for which a practical application in the technological arts is either disclosed in the specification or would have been known to a skilled artisan, or (B) be limited to a practical application within the technological arts”.

MPEP 2106.II.A states that “a process that consists solely of the manipulation of an abstract idea is not concrete or tangible. See *In re Warmerdam*, 33 F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994)”.

Claims 54-58 and 70-80 in view of the above-cited MPEP sections are not statutory because they merely recite a number of computing steps without producing

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any tangible results and/or being limited to practical application within the technological arts. The claims do not indicate use of hardware on which the software runs to perform the steps recited in the body of the claim. Software or program can be stored on a medium and/or executed by a computer. In other words the software must be computer-readable. **The use of a computer is not evident in the claim.** MPEP 2106.IV.B.1(a) refers to "computer-readable" medium with computer program encoded on it."

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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7. Claim 54-58 and 70-72 rejected under 35 U.S.C. 103(a) as being unpatentable over Call (hereinafter "Call")(U.S. Patent Application Publication Number 2002/0143521) in view of Maarek et al. (hereinafter "Maarek et al.") ("Ephemeral Document Clustering for Web Applications", IBM Research Report, RJ 10186, April 2000).

Referring to claim Call is directed to a method for storing data elements as sequences of integers, "wherein identifying data elements/concepts by a predicate key that is an integer" (Call, Paragraph 0070, i.e., *a general purpose database program which stores natural language text and a rich variety of other typed data in an array of integers subdivided into data elements called items..*) "and assigning data elements/concepts of conceptual nearness into distinct sets " (Call, Paragraph 0117, i.e. *Items may be organized into set which consist simply of an ordered collection of item numbers which are gathered in accordance with some criteriaand The time in a set need not be of the same type, however, but may be collected in a single set based on the fact that they share some common attribute. Thus, times of type "apple" and of type "orange" may be collected together to form a set named "treefruit".*)

However, Call does not explicitly disclose that those data elements/concepts are of at least one predicate and an argument and that vectorizing is employed using those integers. On the other hand, Maarek et al teaches a method for clustering using profile (word vectors) and document vectors wherein, "predicate structures" (Maarek et al., Page 5, Paragraph 4, i.e. *An indexing term can be a single term (possibly represented by a canonical form such as its morphological root, lemma or stem), or it may take more*

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complex form such as phrases, syntactic constructs or lexical constructs.) “are vectorized” (Maarek et al., Page 5, Paragraph 4, i.e., For example, if the indexing units are single words, then each word represents an axis in a high-dimensional vector space, where the dimension is equal to the number of words in the collection. and Page 7 Last Paragraph and Page First Paragraph, i.e. Instead of the typical use of single words as indexing units, our indexing unit consists of a pair of words that are linked by a lexical affinity (LA).).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the method of Call for storing data elements as sequences of integers with the method of Maarek et al. for vectorizing phrases/pairs of concepts (words) so that the combined method would be a method for “vectorizing a set of document predicate structures, which comprises the steps of identifying at least one predicate and argument in said set of document predicate structures by a predicate key that is an integer representation, and estimating conceptual nearness of two of said document predicate structures in said set of document predicate structures by subtracting corresponding one of said predicate keys.” Note that, in the method of Call, data elements/concepts are identified by integers and data elements/concepts of similar attribute are organized into sets. Thus, it is inherent in Call's method that conceptual nearness is obtained by subtracting corresponding one of predicate keys. One would have been motivated to do so because clustering using vectors is *much more effective for browsing, because it enables the user to do a logarithmic-time traversal of the tree*

from general to more specific topics, as opposed to the linear-time traversal of non-hierarchical methods. (Maarek et al, Page 4 Second Paragraph).

Referring to claim 55, Call in view of Maarek et al. as applied to claim 54 above teaches the invention as claimed. Call in view of Maarek et al. is directed to "the method of vectorizing a set of document predicate structures, as recited in claim 54, comprising the further step of constructing multi-dimensional vectors using said integer representation" (Maarek et al., Page 5, Paragraph 4, i.e., *For example, if the indexing units are single words, then each word represents an axis in a high-dimensional vector space, where the dimension is equal to the number of words in the collection.* and Page 7 Last Paragraph and Page First Paragraph, i.e. *Instead of the typical use of single words as indexing units, our indexing unit consists of a pair of words that are linked by a lexical affinity (LA).*). Note that Maarek et al employs pair of words and word vectors. Therefore, vectoring method of Maarek et al. is multidimensional.

Referring to claim 56, Call in view of Maarek et al. as applied to claim 55 above teaches the invention as claimed. Call in view of Maarek et al. is directed to "the method of vectorizing a set of document predicate structures, as recited in claim 55, comprising the further step of normalizing said multi-dimensional vectors" (Maarek et al., Page 5 Third Paragraph, i.e. *after normalization.*)

Claims 70-72 are rejected on the same basis as claims 54-56 respectively.

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8. Claim 57-58 and 73-74 rejected under 35 U.S.C. 103(a) as being unpatentable over Call in view of Maarek et al. and further in view of Liddy et al. (hereinafter "Liddy et al.") (U.S. Patent Number 5873056).

Call in view of Maarek et al. as applied to claim 56 above does not explicitly disclose parsing queries employing vectorizing. However, Liddy et al. teaches a method for natural language processing with semantic vector representation, wherein queries are transformed into vectors to match document vectors (Liddy et al., Column 5 Line 23-42).

At the time the invention was made it would have been obvious to a person of ordinary skill in the art to add the feature of transforming queries into vectors as taught by Liddy et al. to the method of Call in view of Maarek et al. so that, in the resultant method, query predicate structures will be included and the method would "further comprise the step of identifying at least one query predicate structure by a second predicate key that is a second integer representation, and constructing second multi-dimensional vectors, for said at least one query predicate structure, using said second integer representation." One would have been motivated to do so in order to *enable retrieving of documents relevant to a query by matching a vector representing the query to the vectors representing documents*" (Liddy Column 1 Line 22-28).

Claim 58 is rejected on the same basis as claim 57.

Claims 73-74 are rejected on the same basis as claim 57-58 respectively.

9. Claim 75-80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Call in view of Maarek et al. and further in view of Liddy et al. and further in view of Dorocak.

Referring to claim 75, Call in view of Maarek et al. and further in view of Liddy et al. as applied to claim 73 is directed to "the method of constructing multi-dimensional vector representations for each document of a set of documents, comprising the step of"

"determining each predicate structure of one or more predicate structures M in each document of the set of documents" (Liddy et al., Column 5 Line 31-33 *The lexical database which is used determines the SFC's*), "said M predicate structures include a predicate and at least one argument" (Maarek et al., Page 5, Paragraph 4, i.e. *An indexing term can be a single term (possibly represented by a canonical form such as its morphological root, lemma or stem), or it may take more complex form such as phrases, syntactic constructs or lexical constructs.*); and

"identifying the predicate and the at least one argument in each of said M predicate structures by a predicate key that is an integer representation" (Call, Paragraph 0070, i.e., *a general purpose database program which stores natural language text and a rich variety of other typed data in an array of integers subdivided into data elements called items..*);

However, the method of Call in view of Maarek et al. and further in view of Liddy et al. does not explicitly disclose determining the fixed number of arguments and filling unfilled arguments with zeros if number of arguments are less than a fixed number. On the other hand, Dorocak teaches a method the specification of context-sensitive properties for programming languages, "wherein the number of arguments are less than

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the specified number of arguments, the unfilled argument positions are filled with zeroes" (Dorocak, Page 104 Line 38-45, i.e. *Where the number of arguments is less than the number of parameters specified in the corresponding definition, the argument list will be assumed to be filled out by arguments whose value is zero.*).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to add the feature of filling the unfilled arguments with zeros as taught by Dorocak to the method of Call in view of Maarek et al. and further in view of Liddy et al. so that the resultant method, "would further comprise

determining a fixed number of arguments q for vector construction" (Dorocak, Page 104, *specified in corresponding definition*);

"constructing an N-dimensional vector representation of each document based upon the predicate and q arguments" (Maarek et al., Page 5, Paragraph 4, i.e., *For example, if the indexing units are single words, then each word represents an axis in a high-dimensional vector space, where the dimension is equal to the number of words in the collection.* and Page 7 Last Paragraph and Page First Paragraph, i.e. *Instead of the typical use of single words as indexing units, our indexing unit consists of a pair of words that are linked by a lexical affinity (LA).*),

"wherein any predicate structure of said M predicate structures that includes less than q arguments fills unfilled argument positions with a numerical zero" (Dorocak, Page 104 Line 38-45, i.e. *Where the number of arguments is less than the number of parameters specified in the corresponding definition, the argument list will be assumed to be filled out by arguments whose value is zero.*).

One would have been motivated to do so in order to *provide a syntactic specification of the default attributes of a language by the description of modifications with are to be made the parsed form (syntactic tree) of instances of language.* (Dorocak, Page 101 Line 7-13).

Referring to claim 76, Official note is taken that it is a notoriously well-known practice in the art of programming languages that excess arguments are truncated (omitted) when number of arguments to a routine is more than the predefined number of arguments of the routine.

The method of Call in view of Maarek et al. and further in view of Liddy et al. and further in view of Dorocak as applied to claim 76 above is directed to the invention as claimed. The method of Call in view of Maarek et al. and further in view of Liddy et al. and further in view of Dorocak is teaches "the method of claim 76, comprising the further step of constructing multi-dimensional vectors using said integer representation" (Maarek et al., Page 5, Paragraph 4, i.e., *For example, if the indexing units are single words, then each word represents an axis in a high-dimensional vector space, where the dimension is equal to the number of words in the collection.*" and Page 7 Last Paragraph and Page First Paragraph, i.e. *Instead of the typical use of single words as indexing units, our indexing unit consists of a pair of words that are linked by a lexical affinity (LA).*).

Claim 78 is rejected on the same basis as claim 56.

Claims 79-80 are rejected on the same basis as claim 77-78 respectively.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Myint whose telephone number is (571) 272-5629. The examiner can normally be reached on 8:30AM-5:30PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-5629.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dennis Myint

AU-2162

Cam y Tuong
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primary Examiner